FY02-9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

SITE: Brown's Dump
BREAK: 17.7
OTHER:

May 15, 2002

Mr. Chris Pearson
City of Jacksonville
140 West Monroe Street
Suite 200
Jacksonville, Florida 32202

Subj: Results of Garden Sampling
Jacksonville Ash Site

Dear Mr. Pearson:

On January 15, 2002 the Science and Ecological Support Division (SESD) of the United States Environmental Protection Agency (EPA) collected samples of soil and greens from three gardens in the area of the 5th & Cleveland property of the Jacksonville Ash Site. Attached is the SESD report of the results dated March 15, 2002, an evaluation of the results dated May 9, 2002 by EPA Office of Technical Services (OTS), and an evaluation of the results dated March 26, 2002 by the Florida Department of Health (FDOH).

The conclusion by FDOH is that the level of lead found when the greens were analyzed are "unlikely to cause illness in children or adults". The EPA OTS evaluated the results using the EPA Integrated Exposure Uptake Biokinetics (IEUBK) model. This evaluation considered the concentrations in the plants as well as direct exposure of the soil lead concentrations in the garden. The OTS evaluation concluded that there is no unacceptable risk associated with ingestion of vegetables from gardens with soil lead concentrations less than 500 mg/kg. The IEUBK model is used to calculate EPA's recommended remedial goal of 400 mg/kg for soil exposure. The unacceptable risk associated with gardens with soil lead above 500 mg/kg is primarily because of direct exposure to the lead in the soil.

Regardless of the soil lead level, EPA recommends good gardening and food preparation practices to lower risk. A fact sheet with good gardening and food preparation practices prepared by ATSDR for Anniston, Alabama is enclosed. This fact sheet should be given to residents near the sites, especially those with gardens.

If you have any questions contact me by phone at (404) 562-8933 or by e-mail at alfano.joe@epa.gov .

Sincerely,

Joseph Alfano

Joseph Alfano
Project Manager

10224289

Attachments

cc: Cindy Laquidara, City of Jacksonville
Diane Kerr, North Riverside Community Group
Deborah Schroth, Florida Legal Services
Dr. Kevin Pegg, Nucleic Assay
Mike Fitzsimmons, FDEP
Mary Nogas, FDEP
Dr. Aaron Hilliard, Duval County Dept. of Health
Susan Bland, FDOH
B. Suzi Ruhl, LEAF
Caroline Philson, EPA EAD
Kevin Koporec, EPA OTS
Wes Hardegree, EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 4, SCIENCE and ECOSYSTEM SUPPORT DIVISION
ATHENS, GEORGIA 30605

MAR 15 2002

4SESD-EIB

MEMORANDUM

SUBJECT: Final Report: Garden Sampling, Jacksonville Ash Sites, Jacksonville, Florida.
SESD Project No. 02-0254

FROM: Fred Sloan
Superfund and Air Section

THRU: Archie Lee, Chief
Superfund and Air Section

To: Joe Alfano, RPM
South Site Management Branch
Waste Management Division

Introduction

The Environmental Investigations Branch (EIB), Superfund and Air Section (SAS) has collected soil and vegetative samples from three small gardens as part of the ongoing investigation into the subject sites. The samples were collected January 15, 2002. Access to the garden plots was arranged by Joe Alfano, who was present during the sampling activities.

Methodology

Twelve samples were collected, six soil and six vegetable (collards and/or mustard greens). The samples were paired as follows: GARD-01, 02; GARD-03, 04; GARD-05, 06; GARD-07, 08; GARD-09, 10; GARD-11, 12. Each pair consisted of a vegetable and corresponding soil sample.

Samples were analyzed for lead, arsenic, antimony, and carcinogenic PAHs: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene. Analytical results are presented in attached Tables 1, 2, and 3. The raw data sheets are also attached.

Samples were collected, handled, and analyzed in accordance with the *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (EISOPQAM, (May 1996, with 1997 revisions), and the *Analytical Support Branch Operations and Quality Control Manual* (ASBOQCM, July 2001). Site specific sampling was performed in accordance with the approved study plan, with the following change: Soil samples were collected from as near the base of the sampled plants as possible, to allow for better correlation with plant results.

Results

Two of the gardens sampled had visible ash present ("Garden 1" and "Garden 2"). The third garden was selected from an area believed to be free of ash and no ash was observed in this garden ("Garden 3"). Samples GARD-01 through GARD-04 were collected from "Garden 1". Samples GARD-05 through GARD-08 were collected from "Garden 2". Samples GARD-09 through GARD-12 were collected from "Garden 3".

Gardens 1 and 2 had concentrations of PAHs in soil ranging from 78J (J - estimated value) ug/kg in GARD-02 to 720J ug/kg in GARD-08. Soil PAHs concentrations were lower in Garden 3, ranging from17J ug/kg in GARD-10 to 170J ug/kg in GARD-12. No PAHs were detected in any of the vegetable samples.

Gardens 1 and 2 had soil antimony concentrations ranging from 1.9A (A - average value) mg/kg in GARD-02 to 38 mg/kg in GARD-06, soil arsenic concentrations ranging from 2.5A mg/kg in GARD-02 to 18 mg/kg in GARD-06, and soil lead concentrations ranging from 490A mg/kg in GARD-02 to 4400 mg/kg in GARD-08. Garden 3 soil metals concentrations were lower, with soil antimony concentrations of 0.29 mg/kg in GARD-10 and 0.32 mg/kg in GARD-12, soil arsenic concentrations of 1.3 in GARD-10 and 0.8 mg/kg in GARD-12, and soil lead concentrations of 61 mg/kg in GARD-10 and 73 mg/kg in GARD-12. Antimony and arsenic were not detected in any of the vegetable samples. Lead was detected in all vegetable samples, with concentrations in Gardens 1 and 2 ranging from 0.11A mg/kg in GARD-01 to 0.28 mg/kg in GARD-07. Vegetable lead concentrations in Garden 3 were 0.038 mg/kg in GARD-09 and 0.089 mg/kg in GARD-12.

Conclusions

Lead was the only analyte detected in vegetable samples collected during this investigation. It must be noted that it is not certain if the reported lead was actually taken up by the plants or if small soil particles containing lead were adhering to the plants. All plant materials were thoroughly washed prior to analysis, but minute particles may have remained.

While concentrations did vary, it was noted that analyte concentrations were greater in gardens with visible ash present, which is to be expected.

If you have any questions or comments, please call me at 706-355-8617, or email at sloan.fred@epa.gov.

Attachments

cc: Joanne Benante
Wes Hardegree

Table 1
Analytical Results for Soil PAHs
Jacksonville Garden Sampling
Jacksonville Ash Sites
Jacksonville, Florida

		GARD-02	GARD-04	GARD-06	GARD-08	GARD-10	GARD-12
		1050	1105	1150	1200	1430	1445
		01/15/2002	01/15/2002	01/15/2002	01/15/2002	01/15/2002	01/15/2002
BENZO(A)ANTHRACENE	UG/KG	170 J	480 J	430 J	500 J	85 J	110 J
BENZO(B)FLUORANTHENE	UG/KG	280 J	710 J	680 J	720 J	120 J	170 J
BENZO(K)FLUORANTHENE	UG/KG	78 J	240 J	220 J	260 J	17 J	56 J
BENZO-A-PYRENE	UG/KG	220 J	540 J	600 J	650 J	130 J	150 J
CHRYSENE	UG/KG	150 J	450 J	550 J	530 J	73 J	95 J
DIBENZO(A,H)ANTHRACENE	UG/KG	200 J	350 J	430 J	430 J	110 J	120 J
INDENO (1,2,3-CD) PYRENE	UG/KG	180 J	340 J	430 J	420 J	97 J	110 J

Data Qualifiers

J-Estimated value.

Table 2
Analytical Results for Soil Metals
Jacksonville Garden Sampling
Jacksonville Ash Sites
Jacksonville, Florida

		GARD-02		GARD-04	GARD-06	GARD-08	GARD-10	GARD-12
		1050		1105	1150	1200	1430	1445
		01/15/2002		01/15/2002	01/15/2002	01/15/2002	01/15/2002	01/15/2002
ANTIMONY	MG/KG	1.9	A	3.1	38	38	0.29	0.32
ARSENIC	MG/KG	2.5	A	8.3	18	16	1.3	0.8
LEAD	MG/KG	490	AJ	500	3000	4400	61	73

Data Qualifiers

A-Average value. J-Estimated value.

Table 3
Analytical Results for Plant Metals
Jacksonville Garden Sampling
Jacksonville Ash Sites
Jacksonville, Florida

	GARD-01	GARD-03	GARD-05	GARD-07	GARD-09	GARD-11
	1045	1100	1145	1155	1425	1440
	01/15/2002	01/15/2002	01/15/2002	01/15/2002	01/15/2002	01/15/2002
LEAD MG/KG	0.11 A	0.16	0.2	0.28	0.038	0.089

Data Qualifiers

A-Average value.

Sample 2 FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-01 /
Media: VEGETATION

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 10:45
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
.28U	MG/KG	BENZO(A)ANTHRACENE
.28U	MG/KG	CHRYSENE
.28U	MG/KG	BENZO(B)FLUORANTHENE
.28U	MG/KG	BENZO(K)FLUORANTHENE
.28U	MG/KG	BENZO-A-PYRENE
.28U	MG/KG	INDENO (1,2,3-CD) PYRENE
.28U	MG/KG	DIBENZO(A,H)ANTHRACENE

17 7 3048

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS — EPA - REGION IV SESD. ATHENS, GA — Amended Date: 02/21/2002 07:47

Sample 21 FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-01 /
Media: VEGETATION

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 10:45
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
0.024U	MG/KG	ARSENIC
0.11A	MG/KG	LEAD
0.012UJ	MG/KG	ANTIMONY

SB RESULTS MAY BE BIASED LOW DUE TO VOLATILIZATION DURING SAMPLE PREP

177 0049

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-02 /
Media: SURFACE SOIL (0" - 12")

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 10:50
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
170J	UG/KG	BENZO(A)ANTHRACENE
150J	UG/KG	CHRYSENE
280J	UG/KG	BENZO(B)FLUORANTHENE
78J	UG/KG	BENZO(K)FLUORANTHENE
220J	UG/KG	BENZO-A-PYRENE
180J	UG/KG	INDENO (1,2,3-CD) PYRENE
200J	UG/KG	DIBENZO(A,H)ANTHRACENE

17 7 0050

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS | EPA - REGION IV SESD, ATHENS, GA | **Production Date: 02/21/2002 08:03**

Sample 2 FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-02 /
Media: SURFACE SOIL (0" - 12")

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 10:50
Ending:

RESULTS	UNITS	ANALYTE
2.5A	MG/KG	ARSENIC
490AJ	MG/KG	LEAD
1.9A	MG/KG	ANTIMONY

MATRIX SPIKE PRECISION OUTSIDE METHOD CONTROL LIMITS FOR PB.

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample 5 FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-03 /
Media: VEGETATION

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:00
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
.29U	MG/KG	BENZO(A)ANTHRACENE
.29U	MG/KG	CHRYSENE
.29U	MG/KG	BENZO(B)FLUORANTHENE
.29U	MG/KG	BENZO(K)FLUORANTHENE
.29U	MG/KG	BENZO-A-PYRENE
.29U	MG/KG	INDENO.(1,2,3-CD) PYRENE
.29U	MG/KG	DIBENZO(A,H)ANTHRACENE

17 7 0052

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample [illegible] FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-03 /
Media: VEGETATION

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:00
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
0.025U	MG/KG	ARSENIC
0.16	MG/KG	LEAD
0.012UJ	MG/KG	ANTIMONY

SB RESULTS MAY BE BIASED LOW DUE TO VOLATILIZATION DURING SAMPLE PREP

17 7 0053

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-04 /
Media: SURFACE SOIL (0" - 12")

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:05
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
480J	UG/KG	BENZO(A)ANTHRACENE
450J	UG/KG	CHRYSENE
710J	UG/KG	BENZO(B)FLUORANTHENE
240J	UG/KG	BENZO(K)FLUORANTHENE
540J	UG/KG	BENZO-A-PYRENE
340J	UG/KG	INDENO (1,2,3-CD) PYRENE
350J	UG/KG	DIBENZO(A,H)ANTHRACENE

17 7 0054

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS — EPA - REGION IV SESD. ATHENS, GA — Amended Date: 02/21/2002 07:47

Sample [illegible] FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-04 /
Media: SURFACE SOIL (0" - 12")

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:05
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
8.3	MG/KG	ARSENIC
500	MG/KG	LEAD
3.1	MG/KG	ANTIMONY

17 7 0055

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
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Sample 2 FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-05 /
Media: VEGETATION

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:45
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
.056U	MG/KG	BENZO(A)ANTHRACENE
.056U	MG/KG	CHRYSENE
.056U	MG/KG	BENZO(B)FLUORANTHENE
.056U	MG/KG	BENZO(K)FLUORANTHENE
.056U	MG/KG	BENZO-A-PYRENE
.056U	MG/KG	INDENO (1,2,3-CD) PYRENE
.056U	MG/KG	DIBENZO(A,H)ANTHRACENE

177 0059

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS | EPA - REGION IV SESD, ATHENS, GA | Amended Date: 02/21/20[illegible] 07:47

Sample FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-05 /
Media: VEGETATION

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:45
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
0.024U	MG/KG	ARSENIC
0.20	MG/KG	LEAD
0.012UJ	MG/KG	ANTIMONY

SB RESULTS MAY BE BIASED LOW DUE TO VOLATILIZATION DURING SAMPLE PREP

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
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R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample [illegible] FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-06 /
Media: SURFACE SOIL (0" - 12")

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:50
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
430J	UG/KG	BENZO(A)ANTHRACENE
550J	UG/KG	CHRYSENE
680J	UG/KG	BENZO(B)FLUORANTHENE
220J	UG/KG	BENZO(K)FLUORANTHENE
600J	UG/KG	BENZO-A-PYRENE
430J	UG/KG	INDENO (1,2,3-CD) PYRENE
430J	UG/KG	DIBENZO(A,H)ANTHRACENE

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-06 /
Media: SURFACE SOIL (0" - 12")

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:50
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
18	MG/KG	ARSENIC
3000	MG/KG	LEAD
38	MG/KG	ANTIMONY

1 7 7 0059

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample 2 FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-07 /
Media: VEGETATION

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:55
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
.055U	MG/KG	BENZO(A)ANTHRACENE
.055U	MG/KG	CHRYSENE
.055U	MG/KG	BENZO(B)FLUORANTHENE
.055U	MG/KG	BENZO(K)FLUORANTHENE
.055U	MG/KG	BENZO-A-PYRENE
.055U	MG/KG	INDENO (1,2,3-CD) PYRENE
.055U	MG/KG	DIBENZO(A,H)ANTHRACENE

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS | EPA - REGION IV SESD, ATHENS, GA | Amended Date: 02/21/2002 07:47

Sample [illegible] FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-07 /
Media: VEGETATION

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 11:55
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
0.025U	MG/KG	ARSENIC
0.28	MG/KG	LEAD
0.012UJ	MG/KG	ANTIMONY

SB RESULTS MAY BE BIASED LOW DUE TO VOLATILIZATION DURING SAMPLE PREP

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
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R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample J FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-08 /
Media: SURFACE SOIL (0" - 12")

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 12:00
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
500J	UG/KG	BENZO(A)ANTHRACENE
530J	UG/KG	CHRYSENE
720J	UG/KG	BENZO(B)FLUORANTHENE
260J	UG/KG	BENZO(K)FLUORANTHENE
650J	UG/KG	BENZO-A-PYRENE
420J	UG/KG	INDENO (1,2,3-CD) PYRENE
430J	UG/KG	DIBENZO(A,H)ANTHRACENE

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS — EPA - REGION IV SESD. ATHENS, GA — Amended Date: 02/27/2002 07:47

Sample 2170 FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-08 /
Media: SURFACE SOIL (0" - 12")

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 12:00
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
16	MG/KG	ARSENIC
4400	MG/KG	LEAD
38	MG/KG	ANTIMONY

177 0063

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-09 /
Media: VEGETATION

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:25
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
.29U	MG/KG	BENZO(A)ANTHRACENE
.29U	MG/KG	CHRYSENE
.29U	MG/KG	BENZO(B)FLUORANTHENE
.29U	MG/KG	BENZO(K)FLUORANTHENE
.29U	MG/KG	BENZO-A-PYRENE
.29U	MG/KG	INDENO (1,2,3-CD) PYRENE
.29U	MG/KG	DIBENZO(A,H)ANTHRACENE

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS — EPA - REGION IV SESD, ATHENS, GA — Amended Date: 02/21/2002 07:47

Sample 2... FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-09 /
Media: VEGETATION

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:25
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
0.025U	MG/KG	ARSENIC
0.038	MG/KG	LEAD
0.012UJ	MG/KG	ANTIMONY

SB RESULTS MAY BE BIASED LOW DUE TO VOLATILIZATION DURING SAMPLE PREP

177 0065

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-10
Media: SURFACE SOIL (0" - 12")

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:30
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
85J	UG/KG	BENZO(A)ANTHRACENE
73J	UG/KG	CHRYSENE
120J	UG/KG	BENZO(B)FLUORANTHENE
17J	UG/KG	BENZO(K)FLUORANTHENE
130J	UG/KG	BENZO-A-PYRENE
97J	UG/KG	INDENO (1,2,3-CD) PYRENE
110J	UG/KG	DIBENZO(A,H)ANTHRACENE

9908 0066 7 7 1

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS

Sample FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-10 /
Media: SURFACE SOIL (0" - 12")

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:30
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
1.3	MG/KG	ARSENIC
61	MG/KG	LEAD
0.29	MG/KG	ANTIMONY

17 7 0067

A-average value, NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

EXTRACTABLES SAMPLE ANALYSIS EPA - REGION IV SESD, ATHENS, GA Production Date: 03/05/2002 14:04

Sample [redacted], FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-11 /
Media: VEGETATION

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:40
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
.045U	MG/KG	BENZO(A)ANTHRACENE
.045U	MG/KG	CHRYSENE
.045U	MG/KG	BENZO(B)FLUORANTHENE
.045U	MG/KG	BENZO(K)FLUORANTHENE
.045U	MG/KG	BENZO-A-PYRENE
.045U	MG/KG	INDENO (1,2,3-CD) PYRENE
.045U	MG/KG	DIBENZO(A,H)ANTHRACENE

17 7 8903 0068

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

METALS SAMPLE ANALYSIS EPA - REGION IV SESD, ATHENS, GA Amended Date: 02/21/2002 07:41

Sample 2 FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-11 /
Media: VEGETATION

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:40
Ending:

DATA REPORTED ON WET WEIGHT BASIS

RESULTS	UNITS	ANALYTE
0.025U	MG/KG	ARSENIC
0.089	MG/KG	LEAD
0.012UJ	MG/KG	ANTIMONY

1 7 7 0069

SB RESULTS MAY BE BIASED LOW DUE TO VOLATILIZATION DURING SAMPLE PREP

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample FY 2002 Project: 02-0254
SPECIFIED TESTS
Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-12 /
Media: SURFACE SOIL (0" - 12")

Produced by: Revell, Dennis
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:45
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
110J	UG/KG	BENZO(A)ANTHRACENE
95J	UG/KG	CHRYSENE
170J	UG/KG	BENZO(B)FLUORANTHENE
56J	UG/KG	BENZO(K)FLUORANTHENE
150J	UG/KG	BENZO-A-PYRENE
110J	UG/KG	INDENO (1,2,3-CD) PYRENE
120J	UG/KG	DIBENZO(A,H)ANTHRACENE

177 0070

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

Sample 4 FY 2002 Project: 02-0254

SPECIFIED TESTS

Facility: Jacksonville Ash Jacksonville, FL
Program: SF
Id/Station: GARD-12 /
Media: SURFACE SOIL (0" - 12")

Produced by: Wasko, Mike
Requestor: Joe Alfano
Project Leader: FSLOAN
Beginning: 01/15/2002 14:45
Ending:

DATA REPORTED ON DRY WEIGHT BASIS

RESULTS	UNITS	ANALYTE
0.80	MG/KG	ARSENIC
73	MG/KG	LEAD
0.32	MG/KG	ANTIMONY

17 7 0071

A-average value. NA-not analyzed. NAI-interferences. J-estimated value. N-presumptive evidence of presence of material.
K-actual value is known to be less than value given. L-actual value is known to be greater than value given. U-material was analyzed for but not detected. the number is the minimum quantitation limit.
R-qc indicates that data unusable. compound may or may not be present. resampling and reanalysis is necessary for verification.

FLORIDA DEPARTMENT OF HEALTH

Jeb Bush
Governor

John O. Agwunobi, M.D., M.B.A.
Secretary

March 26, 2002

Mr. Joe Alfano
Remedial Project Manager
Environmental Protection Agency
61 Forsyth Street, S.W.
Atlanta, Georgia 30303

Subject: 5th and Cleveland Incinerator (Emmett Reed Park)
Duval County, Jacksonville, Florida

Dear Joe:

Thanks for calling me for assistance to determine if lead in collards and mustard greens from gardens near this site may cause a health risk. Since the highest lead concentration in these vegetables was 0.28 mg/kg, I used this concentration and average consumption rates of these two types of vegetables to calculate a dose in mg/kg/day for a child or an adult eating these vegetables. The calculated dose tells us if ingesting this concentration of lead in the vegetables is likely to cause illness in children and/or adults.

Average Consumption for Collard Greens = 0.0189 Grams/kg Body Weight-Day

Average Consumption for Mustard Greens = 0.0145 Grams/kg Body Weight-Day

The average consumption rates are included in EPA's Exposure Factors Handbook Volume II – Food Ingestion Factors dated July 1997. Average consumption rates are based on mean per capita intake rates (as consumed) for vegetables based on all sex/age/demographic subgroups. For a child weighing 15 kg, the calculated dose is 0.00008 mg/kg/day using the above intake rates (average consumption) for collard greens and mustard greens with a lead concentration of 0.28 mg/kg. For an adult weighing 70 kg the calculated dose is 0.0004 mg/kg/day.

Comparing the calculated dose to ATSDR's MRLs in the July 1999 Toxicological Profile, eating these vegetables with a lead concentration of 0.28 mg/kg in collards or mustard greens is unlikely to cause illness in children or adults.

I am always glad to be of assistance to your remediation group. If you need further assistance or have any questions please call me at (850) 245-4444 ext. 2310.

Sincerely,

Susan A. Bland

Susan Ann Bland
Biological Scientist IV
Bureau of Environmental Epidemiology

sab

Division of Environmental Health

4052 Bald Cypress Way, Bin #A-08 • Tallahassee, FL 32399-1712

Collards:

Average Consumption for Collard Greens = 0.0189 Grams/kg Body Weight-Day*
[Pb] in collards = 0.28 mg/kg
15 kg Child

Dose Calculations

(0.28 mg/kg)(0.0189grams/kg BW-day)(15 kg)
= (0.28 grams/day)(280 ug/1000 grams)
=.0784 ug/day = .000078 mg/kg/day or 7.8×10^{-5} mg/kg/day

OR

(0.0189 g/kg BW)(15 kg BW) = 0.2835 g or 283.5 mg Collards

[Pb] = 0.28 mg/kg

(283.5 mg Collards)(0.28 mg/kg Collards)
= (0.0002835 kg)(0.28 mg/kg Collards) = 7.938×10^{-5} mg/kg/day

OR

Total Collards = (0.0189 grams/kg-day)(15 kg) = 0.28 grams collards/day

(0.28 g collards/day)(0.28 ug/g collards) = 0.0784 ug collards/day
= 7.8×10^{-5} mg/kg/day

If convert "as consumed" intake rates to dry weight intake rate:

Cooked collards intake rate (dry weight):

$IR_{dw} = IR_{ac}*[(100-W)/100] = 0.0189\ [(100-95.72)/100] = 0.0008$
Therefore, the calculated dose for a child eating cooked collards = 3.4×10^{-6} mg/kg/day

Raw collards intake rate (dry weight):

$IR_{dw} = IR_{ac}*[(100-W)/100] = 0.0189\ [(100-93.9)/100] = 0.0012$
Therefore, the calculated dose for a child eating not cooked collards = 5.0×10^{-6} mg/kg/day

Both calculated doses for cooked and raw collards using dry weight are less than the calculated dose for as consumed.

IR = Intake rate ac = as consumed dw = dry weight

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

61 Forsyth Street
Atlanta, Georgia 30303

MEMORANDUM

DATE: May 9, 2002

Subject: Review of Vegetable Garden Data
Jacksonville Ash and Browns Dump Sites
Jacksonville, Florida

To: Joseph Alfano, RPM
South Site Management Branch

Wes Hardegree, RPM
South Site Management Branch

From: H. Glenn Adams, Risk Assessment Specialist
Office of Technical Services

To address one of the data gaps identified in the risk assessments for the Jacksonville Ash sites and the Browns Dump site, samples were collected on January 15, 2002, from three gardens located near the 5th and Cleveland portion of the site. I have reviewed EPA's Science and Ecosystem Support Division (SESD) report dated March 15, 2002 on the sampling and analysis of this data; the March 16, 2002, memorandum from Susan Bland, Florida Department of Health, which evaluated this data. I also reviewed the Agency for Toxic Substances and Disease Registry's (ATSDR) fact sheet titled "Gardening in Anniston." All of this information was used in my evaluation of what risks are present from gardens that are potentially contaminated from the ash sites.

The SESD report provides information from two surface soil samples and two vegetable samples from each of the three gardens. The soil samples and vegetable samples were analyzed for the main contaminants of concern (COCs) at the sites [lead, arsenic, antimony, and polynuclear aromatic hydrocarbons (PAHs)]. Only lead was detected in the vegetables and each of the gardens represented a different level of soil lead contamination. Listed below are the maximum concentrations of lead in the garden soils and the maximum detected concentration of lead in the corresponding vegetable sample :

1. Garden 1: maximum soil lead concentration of 500 mg/kg with a maximum vegetable lead concentration of 0.16 mg/kg,
2. Garden 2: maximum soil lead concentration of 4,400 mg/kg with a maximum vegetable lead concentration of 0.28 mg/kg
3. Garden 3: maximum soil lead concentration of 73 mg/kg with a maximum vegetable lead concentration of 0.089 mg/kg,

The vegetables sampled were collards and/or mustard greens. These vegetables were chosen because of their availability and the fact that they were thought to represent the vegetables most likely to bioaccumulate lead, therefore providing the most conservative data available.

To determine if the lead levels detected would result in an unacceptable risk via ingestion of the vegetables, the EPA Integrated Exposure Uptake Biokinetic (IEUBK) model was run using the maximum detected lead concentrations in the vegetables from each of the three gardens. For this modeling event, it was conservatively assumed that 25% of all vegetables ingested come from the home garden and assumed that all of the vegetables ingested from that garden have the same concentration of lead in them. These are very conservative assumptions for four reasons:

1) 25% of all vegetables consumed are assumed to come from the garden,
2) the lead concentration in all vegetables are assumed to be the same as the concentration detected in the greens (e.g., tomatoes would have the same concentration as greens),
3) the data may represent some soil particles because the vegetables were washed but not actually cleaned of all dirt before being analyzed, and
4) exposure to children, the most sensitive receptor population, was evaluated.

The results of the IEUBK model conclude that under these circumstances the average blood lead level would only slightly increase even at the highest detected concentrations of lead in the greens. EPA Region 4 uses the Probability Distribution curve as one of its decision making tools. The goal is for the probability of being above the 10 ug/dl blood lead level cutoff to be less than 5%. The two lower detected concentrations are below 5% (2% and 3%, respectively) with the highest detected concentration being at 5.6% which is only slightly above the 5% goal.

It can be concluded from the above information that there is no unacceptable risks associated from ingestion of vegetables from gardens with soil lead concentrations less than 500 mg/kg. The two samples collected from the highest soil lead contamination location (maximum concentration of 4,400 mg/kg lead) showed a slight increase above acceptable levels via ingestion of vegetables, but it has already been determined by EPA that residential exposure to soils with lead concentrations of 4,400 mg/kg is unacceptable via direct contact to those soils.

Susan Bland's report from the Florida Department of Health concluded that "eating these vegetables with a lead concentration of 0.28 mg/kg in collards or mustard greens is unlikely to cause illness in children or adults.".

The ATSDR fact sheet titled "Gardening in Anniston" provides information on good gardening practices and preparation tips. This fact sheet is attached and I recommend that copies be given to concerned citizens near the site or that a ATSDR be requested to provide a fact sheet for the Jacksonville sites.

In conclusion, based on the above data and references, the use of vegetable gardens with soil lead concentrations below or only slightly above EPA's recommended remedial goal of 400 mg/kg should not result in any significant increase in blood lead levels. Garden soil levels of lead significantly above 400 mg/kg may pose unacceptable risk with the risk potential increasing with increasing levels of soil lead. Regardless of the soil lead level, following good gardening and food preparation practices will lower risks.

If you have any questions or if you want to discuss these comments, please call me at 404-562-8771.

Attachment

cc: Elmer Akin, OTS
Kevin Koporec, OTS

Vegetable Garden.wpd

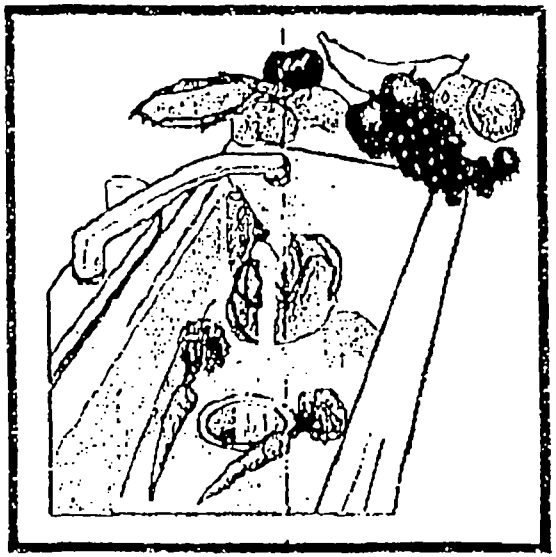
s. By taking a few simple precautions, you can reduce your chances of being exposed to contaminated soil.

Preparing Your Garden

- Adding material such as compost or topsoil from outside sources such as commercial gardening centers will enrich your soil and help reduce the amount of contaminants that can be taken up by plants.

Working in the Garden

- Do not eat or drink while working in your garden because contaminated soil and dust might get on your food and you could accidentally swallow it.
- Avoid working in the garden on windy days, when dust can be stirred up and get in your nose or mouth.
- Be sure to wash your hands and work clothes to remove dust and dirt after gardening, and take off your shoes at the door to avoid tracking soil into your home.



Preparing Fruits and Vegetables

- Clean your hands, cutting boards, and kitchen tools with hot, soapy water and rinse well before and after handling produce.
- Run cool or slightly warm tap water over all produce several times to clean it. This is a good idea whether it is homegrown or comes from a market. Do not wash it with soap because some produce absorbs soap ingredients.
- Before cooking, soak greens in cool water overnight and then rinse thoroughly until the water runs clear. This is especially important for produce that grows low to the ground, such as collard greens, spinach, and lettuce.
- Scrub firm fruits and root-grown vegetables with a clean brush to remove dust and dirt before peeling or eating. These include carrots, turnips, potatoes, rutabagus, radishes, onions, and apples, just to mention a few.
- Wash berry fruits (strawberries, blackberries, etc.) and remove the "caps" (the tops of the berries where the stem and leaves attach).
- Remove outer leaves of leafy crops and thoroughly wash the remaining produce in water containing vinegar (1 percent).

Buy Some, Grow Some!

- Eat some fruits and vegetables from your garden and some from the farmers' market or grocery store. Eating a mix of home grown and commercial products can help reduce your potential for exposure.

17 7 C76